UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/516,982	06/21/2005	James T. Kadonaga	1034123-000150	1391

41790 7590 10/12/2007
BUCHANAN, INGERSOLL & ROONEY LLP
P.O. BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER	
STRZELECKA, TERESA E	
ART UNIT	**PAPER NUMBER**
1637	

NOTIFICATION DATE	DELIVERY MODE
10/12/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com
debra.hawkins@bipc.com

Office Action Summary	Application No.	Applicant(s)	
	10/516,982	KADONAGA ET AL.	
	Examiner	Art Unit	
	Teresa E. Strzelecka	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 June 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) *4,6,7,9,11,12,14,15,18,20 and 22-29* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,8,10,13,16,17,19,21 and 30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/10/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☒ Other: *Notice to Comply*.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I (claims 1-21 and 30, species A, D, F, H, K and R) in the reply filed on June 29, 2007 is acknowledged. The traversal is on the ground(s) that Groups I and II should be examined together, since it does not matter whether the method is performed in vivo or in vitro, since the reactions have the same components and the methods have a unifying technical feature. Applicants further argue that the species election requirement should be withdrawn, since all of the species can be searched together without an undue burden. Applicants state:

"For example, it is unclear to the Applicants how one could conduct a search for a "promoter" target sequence (i.e., the species designated "L" in the set entitled "Species of the target sequence") without necessarily performing a search for an "enhancer" target seqence (i.e., the species designated "M" in the set entitled "Species of the target sequence")."

This is not found persuasive because, first, there is no unifying technical feature of the claims, as noted in the "Election/Restriction Requirement". Further, the claims of Group II are drawn specifically to a treatment method, therefore, searching Group I will not result in references pertinent to the claims of Group II. Finally, regarding the election of species, it is very easy to see how one could search for "promoter" without searching for "enhancer": somebody performing recombination using only cloned promoters.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 4, 6, 7, 9, 11, 12, 14, 15, 18, 20 and 22-29 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to nonelected species and inventions, there being no

allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on June 29, 2007.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

4. Claims 1-3, 5, 8, 10, 13, 16, 17, 19, 21 and 30 will be examined.

Information Disclosure Statement

5. The information disclosure statement (IDS) submitted on July 10, 2006 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Sequence Rules Compliance

6. This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 C.F.R. § 1.821(a)(1) and (a)(2). However, this application fails to comply with the requirements of 37 C.F.R. §§ 1.821-1.825 for the reason(s) set forth on the attached Notice To Comply With Requirements For Patent Applications Containing Nucleotide Sequence And/Or Amino Acid Sequence Disclosures.

APPLICANT IS GIVEN time of response to this office action WITHIN WHICH TO COMPLY WITH THE SEQUENCE RULES, 37 C.F.R. §§ 1.821-1.825. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 C.F.R. § 1.136. In no case may an applicant extend the period for response beyond the six month statutory

period. Direct the response to the undersigned. Applicant is requested to return a copy of the attached Notice to Comply with the response.

Page 26, paragraph [0068], contains an amino acid sequence with SEQ ID NO: 2, which was not included in the originally submitted sequence listing.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 1-3, 13, 16 and 30 rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Specifically, claims 1 and 30 read on the naturally occurring homologous recombination processes within prokaryotic and eukaryotic cells.

Claim Interpretation

9. Both claims 1 and 30 are interpreted as encompassing in vitro and in vivo homologous recombination processes.

10. Applicants described the term "nucleosomal polynucleotide" on page 8, paragraph [0025], as follows:

"As used herein, a "nucleosomal polynucleotide" includes any nucleic acid associated with histone core proteins, or histone-like core proteins, forming a chromatin-like structure." Therefore, it is interpreted as any nucleic acid associated with histones or other proteins, as Applicants did not define the terms "histone-like core-proteins" or "chromatin-like structure".

11. Applicants defined the term "exogenous nucleosomal polynucleotide" on page 10, [0030], as follows:

"As used herein, an "exogenous nucleosomal polynucleotide" is a polynucleotide which is transferred into a target cell but which has not been replicated in that host cell;"

12. Applicants defined the term "target nucleic acid sequence" on page 10, [0032], as follows:

"As used herein, the term "target nucleic acid sequence" refers to polynucleotide sequences suitable for recombination with a nucleosomal polynucleotide." Therefore the term is interpreted as any nucleic acid sequence.

13. Applicants defined the term "recombinase" on page 11, [0033], as follows:

"As used herein, "recombinase" refers to polypeptides having essentially all or most of the same functions, particularly the recombinase can: (i) properly bind to and position a nucleosomal polynucleotide to a homologous target and (ii) facilitate homologous recombination."

14. Applicants did not define the term "Rad51 associated activity", therefore it is interpreted as any recombinase activity.

15. Applicants did not define the term "plasmid", therefore it is interpreted as any nucleic acid vector or virus.

16. Claim 1 encompasses homologous recombination performed either in vitro or in vivo. The dependent claims 5 and 10 refer to exogenous recombinase and target nucleic acid, respectively. Since the term "exogenous" has not been defined in the context of in vitro reaction, the terms are interpreted as any recombinase and any target nucleic acid, respectively.

Claim Rejections - 35 USC § 112

17. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

18. Claims 5 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 5 and 10 are drawn to the method of claim 1, where the recombinase is exogenously produced (claim 5) and where the target nucleic acid is an exogenous sequence (claim 10). Since claim 1 encompasses both in vitro and in vivo method, it is not clear what "exogenous" means in the context of an in vitro method.

Claim Rejections - 35 USC § 102

19. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

20. Claims 1-3, 16 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Kanaar et al. (Trends in Cell Biol., vol. 8, pp. 483-489, 1998; cited in the IDS).

Claims 1 and 30 will be considered together in claim 1, since it is a species of claim 30.

Regarding claims 1, 16 and 30, Kanaar et al. teach homologous recombination in eukaryotic cells to repair double-stranded DNA breaks (Fig. 1; page 484, paragraphs 3-6; page 485, paragraphs 1-4). Since all of the nucleic acids in eukaryotic cells are associated with histones, Kanaar et al. anticipates the limitations of claims 1, 16 and 30.

Regarding claims 2 and 3, Kanaar et al. teach Rad51 recombinase (Fig. 1).

21. Claims 1-3, 10, 13, 16, 17, 19, 21 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Wiesmuller et al. (J. Virology, vol. 70, pp. 737-744, 1996), as evidenced by Polisky

et al. (PNAS USA, vol. 72, pp. 2895-2899, 1975) and Kanaar et al. (Trends in Cell Biol., vol. 8, pp. 483-489, 1998; cited in the IDS).

Claims 1 and 30 will be considered together in claim 1, since it is a species of claim 30.

Regarding claims 1 and 30, Wiesmuller et al. teach a method of promoting homologous recombination, the method comprising:

providing a nucleosomal polynucleotide comprising histones and contacting, under conditions that support homologous recombination, the polynucleotide with a target nucleic acid sequence, wherein the target nucleic acid comprises a nucleotide sequence homologous to the nucleosomal polynucleotide (Wiesmuller et al. teach providing two SV40-based vectors to study frequency of homologous recombination in monkey PRK cells (page 738, paragraphs 2-4, 10 and 11; page 739, paragraphs 1-3). Wiesmuller et al. teach that SV40 particles form minichromosomes within eukaryotic cells (page 737, last paragraph), as evidenced also by Polisky et al., who teach association of SV40 with histones (page 2895, paragraphs 2-4). Therefore, by teaching SV40 viral particles within eukaryotic cells Wiesmuller et al. teach nucleosomal polynucleotide and target polynucleotide associated with histones.

Regarding claims 2 and 3, Wiesmuller et al. teach monkey cells (page 738, second paragraph; page 739, third paragraph). Therefore, since mammalian cells perform homologous recombination, Wiesmuller et al. inherently teach Rad51 associated activity. Further, as evidenced by Kanaar et al., mammalian cells contain the Rad51 recombinase (p. 486, Table 1), therefore Wiesmuller et al. inherently teach Rad51.

Regarding claim 10, Wiesmuller et al. teach transfecting the cells with SV40 viruses, therefore they teach exogeneous target sequences (page 738, last paragraph; page 739, first paragraph).

Regarding claim 13, Wiesmuller et al. teach the target nucleic acid being a coding sequence (page 739, second paragraph).

Regarding claim 16, Wiesmuller et al. teach association of SV40 into minichromosomes within eukaryotic cells (page 737, last paragraph), as evidenced also by Polisky et al., who teach association of SV40 with histones in monkey cells (page 2895, paragraphs 2-4) and core histones (Abstract; page 2896, paragraphs 4-6). Therefore, by teaching SV40 viral particles within eukaryotic cells Wiesmuller et al. teach nucleosomal polynucleotide and target polynucleotide associated with core histones.

Regarding claim 17, Wiesmuller et al. teach SV40 viruses (page 738, third and fourth paragraphs), therefore they teach plasmids.

Regarding claims 19 and 21, Wiesmuller et al. teach one of the SV40 particles comprising sequence which generates a mutation in a target sequence altering its expression (page 739, second paragraph; Fig. 1).

22. Claims 1-3, 5, 8, 10, 13, 16, 17 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Datta et al. (J. Biol. Chem., vol. 276, pp. 18018-18023, May 2001) as evidenced by Polisky et al. (PNAS USA, vol. 72, pp. 2895-2899, 1975).

Claims 1 and 30 will be considered together in claim 1, since it is a species of claim 30.

Regarding claims 1 and 30, Datta et al. teach a method of promoting homologous recombination, the method comprising:

providing a nucleosomal polynucleotide comprising histones and contacting, under conditions that support homologous recombination, the polynucleotide with a target nucleic acid sequence, wherein the target nucleic acid comprises a nucleotide sequence homologous to the nucleosomal polynucleotide (Datta et al. teach providing an SV40-based plasmid pSupFG1/G144C

(= nucleosomal polynucleotide) with a 40 bp fragment homologous to bp 121-160 of the supFG1-144 gene (page 18019, second and third paragraph; Fig. 1) and a donor oligonucleotide (= target nucleic acid) (page 18019, second and fourth paragraph; Fig. 1) under conditions which promote homologous recombination (page 18019, paragraphs 8 and 9; page 18020, second and third paragraph). As evidenced by Polisky et al. SV40 particles associate with histones (page 2895, paragraphs 2-4), therefore, by teaching SV40 plasmid in eukaryotic cell extract, Datta et al. inherently teach nucleosomal polynucleotides.).

Regarding claims 2 and 3, Datta et al. teach Rad51 associated recombinase activity (page 18019, second paragraph; page 18020, 6th paragraph).

Regarding claim 5, Datta et al. teach recombinase in a cell extract (page 18019, paragraphs 8 and 9), therefore they teach exogenous recombinase.

Regarding claim 8, Datta et al. teach recombination in a cell extract in vitro (page 18019, paragraphs 8 and 9).

Regarding claim 10, Datta et al. teach exogenous target sequence (page 18019, fourth paragraph; Fig. 1).

Regarding claim 13, Datta et al. teach a sequence coding for a supFG1-144 gene (Fig. 1).

Regarding claim 16, Datta et al. teach SV40-based plasmid within eukaryotic cell extract (page 18019, 9th paragraph). As evidenced also by Polisky et al. SV40 particles associate with histones in monkey cells (page 2895, paragraphs 2-4) and core histones (Abstract; page 2896, paragraphs 4-6). Therefore, by teaching SV40 plasmid within eukaryotic cells Datta et al. teach nucleosomal polynucleotide associated with core histones.

Regarding claim 17, Datta et al. teach SV40-based plasmid (Fig. 1).

23. No claims are allowed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Teresa E. Strzelecka whose telephone number is (571) 272-0789. The examiner can normally be reached on M-F (8:30-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on (571) 272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Teresa E Strzelecka
Primary Examiner
Art Unit 1637

Teresa Strzelecka
10/4/07

Notice to Comply	Application No.	Applicant(s)	
	10/516,982	KADONAGA ET AL.	
	Examiner	Art Unit	
	Teresa E. Strzelecka	1637	

NOTICE TO COMPLY WITH REQUIREMENTS FOR PATENT APPLICATIONS CONTAINING NUCLEOTIDE SEQUENCE AND/OR AMINO ACID SEQUENCE DISCLOSURES

Applicant must file the items indicated below within the time period set the Office action to which the Notice is attached to avoid abandonment under 35 U.S.C. § 133 (extensions of time may be obtained under the provisions of 37 CFR 1.136(a)).

The nucleotide and/or amino acid sequence disclosure contained in this application does not comply with the requirements for such a disclosure as set forth in 37 C.F.R. 1.821 - 1.825 for the following reason(s):

☒ 1. This application clearly fails to comply with the requirements of 37 C.F.R. 1.821-1.825. Applicant's attention is directed to the final rulemaking notice published at 55 FR 18230 (May 1, 1990), and 1114 OG 29 (May 15, 1990). If the effective filing date is on or after July 1, 1998, see the final rulemaking notice published at 63 FR 29620 (June 1, 1998) and 1211 OG 82 (June 23, 1998).

☐ 2. This application does not contain, as a separate part of the disclosure on paper copy, a "Sequence Listing" as required by 37 C.F.R. 1.821(c).

☐ 3. A copy of the "Sequence Listing" in computer readable form has not been submitted as required by 37 C.F.R. 1.821(e).

☐ 4. A copy of the "Sequence Listing" in computer readable form has been submitted. However, the content of the computer readable form does not comply with the requirements of 37 C.F.R. 1.822 and/or 1.823, as indicated on the attached copy of the marked -up "Raw Sequence Listing."

☐ 5. The computer readable form that has been filed with this application has been found to be damaged and/or unreadable as indicated on the attached CRF Diskette Problem Report. A Substitute computer readable form must be submitted as required by 37 C.F.R. 1.825(d).

☐ 6. The paper copy of the "Sequence Listing" is not the same as the computer readable from of the "Sequence Listing" as required by 37 C.F.R. 1.821(e).

☒ 7. Other: The submitted sequence listing contains only SEQ ID NO: 1. However, SEQ ID NO: 2 is present in the disclosure on page 26, paragraph [0068].

Applicant Must Provide:

☒ An initial or substitute computer readable form (CRF) copy of the "Sequence Listing".

☒ An initial or substitute paper copy of the "Sequence Listing", as well as an amendment directing its entry into the specification.

☒ A statement that the content of the paper and computer readable copies are the same and, where applicable, include no new matter, as required by 37 C.F.R. 1.821(e) or 1.821(f) or 1.821(g) or 1.825(b) or 1.825(d).

For questions regarding compliance to these requirements, please contact:

For Rules Interpretation, call (703) 308-4216
For CRF Submission Help, call (703) 308-4212
PatentIn Software Program Support
Technical Assistance.....703-287-0200
To Purchase PatentIn Software.....703-306-2600

PLEASE RETURN A COPY OF THIS NOTICE WITH YOUR REPLY